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An Introduction to the Ant Fauna of Japan, with a Check List (Hymenoptera, Formicidae)[1,2]

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Synopsis The present status of the classification of Japanese ants is briefly reviewed. *Smithistruma habei* is a new synonym of *S. incerta*. *Tetramorium smithi* is new to Japan. A check list of ants of Japan is presented, where 173 living and 1 fossil forms are listed. At least 219 species are considered to be living in Japan, but only 67 species may be identifiable. The number of living species in each genus is given.

Introduction

The classification of ants of Japan has remained unsatisfactory. No revisionary studies have been accomplished on most genera. There are many undescribed or undetermined species in Japan, and geographical variation has remained unknown for almost all species. Except the species belonging to genera *Stenamma*, *Messor*, *Kyidris*, *Polyergus*, and *Polyrhachis*, most species of Japan may not be identified. The reasons for these unsatisfactory conditions are (1) the difficulty of classification proper, such as the great and complicated variation seen in intracolonial and intercolonial populations, and (2) the loss or absence of types or reference specimens in Japan.

KUBOTA (1971) presented a check list of the ants of Japan. This is a laborious work and very useful. However, there are several omissions, unpublished synonymies (correct or incorrect), unpublished generic transfer; and, the present status of each form is not mentioned. Moreover, several authors (SONOBE, 1973; TANAKA, 1974; KUBOTA, 1976; SONOBE & DLUSSKY, 1977; BARONI URBANI, 1977; BOLTON, 1977; YAMAUCHI, 1979; BROWN & BOISVERT, 1979; SHINDO, 1979) have added a total of 17 species to the ant fauna of Japan since 1971.

There are several reports in which many forms are raised to specific rank without any explanations (HAYASHIDA, 1971, etc; SONOBE, 1971, 1977 a, etc; MORISITA & ONOYAMA, 1974). Such treatments might cause confusions and be obstacles to sound classification.

Correct identification is necessary for biogeographic and ecological studies of

1) Taxonomy and ecology of the ants of Japan, (1).

2) Contribution from the Laboratory of Wildlife Resource Ecology, Obihiro University of Agriculture and Veterinary Medicine, No. 27.

ants as well as taxonomic ones themselves. It is needed that revisional works will appear as soon as possible.

Considering the present situation stated above, I have first of all intended to make a conservative but up-to-date check list. Before giving the list, I publish invalid names, a new synonym, and a new species to Japan.

I. Nomen Nudum, New Synonym, and New Record to Japan

A. Nomen nudum

1. *Aphaenogaster* (*Attomyrmex* [!]) *expolitus* AZUMA, 1950: 34. Nomen nudum.

No description follows, this name is therefore apparently invalid.

2. *Leptothorax* (*Lep.*) *arimensis* AZUMA, 1953: 3. Nomen nudum.

Although there is a short description of four lines, "Warera", in which the description appeared, is a school magazine and not a scientific journal.

B. New synonym

Smithistruma incerta BROWN

Smithistruma (*Smithistruma*) *incerta* BROWN, 1949a: 10–12. Female, ergatotype worker. Type locality: Kirishima Mountain, Kyushu (F. SILVESTRI leg., MCZ).

Strumigenys (*Cephaloxys*) *japonica* ITO, WHEELER, 1928a: 115–116. Female, worker.

Smithistruma (*Smithistruma*) *habei* AZUMA, 1951: 89, fig. A, B. Worker. Type locality: Mt. Minoo, Osaka Pre. (T. HABE leg., AZUMA Coll.). New synonymy. [Holotype examined.]

It is strange that AZUMA (1951) did not mention *S. incerta* in his original description though he gave BROWN (1949 a) as literature. The holotype of *habei* agrees with the original description of *incerta*. The original figures of *habei* has proved incorrect in several points. I compared directly the holotype worker of *habei* with a worker specimen from Minamata, Kumamoto-Ken identified with *incerta* by Prof. W. L. BROWN which was given to me through the courtesy of Mr. M. KUBOTA. There is no morphologically significant difference between the two, though the color of *habei* holotype is a little paler than that of the *incerta* specimen. A dealate female specimen, which was mounted on a triangular card together with the holotype [this female specimen should have been a paratype, but was not mentioned in AZUMA (1951)], is also identical with female specimens of *incerta* from Yamanaka, Shizuoka-Ken. Measurements in mm of the *habei* holotype are as follows: head length, 0.56; head width, 0.38 (thus, cephalic index is 68); WEBER's length of trunk, 0.56; mandibular length, 0.06; scape length, 0.31.

C. New record

BOLTON published revisionary works on the genus *Triglyphothrix* in the world in 1976 and the genus *Tetramorium* in the Oriental and Indo-Australian regions in 1977. I identified four species of Okinawan ants of these genera in ONOYAMA (1976). *Triglyphothrix striatidens*? (the 41st species in the list of ONOYAMA, 1976) is *Triglyphothrix lanuginosa*, *Triglyphothrix*? (*Tetramorium*?) sp. (42) is *Tetramorium amium* [this species is certainly different from *T. mixtum*, for instance, in

that the basal border of the first gastral tergite is less concave. See BOLTON (1977): 113]. *Tetramorium* sp. A (44) is *Tetramorium simillimum*, and *Xiphomyrmex* sp. (45) is *Tetramorium smithi*. The last species is new to Japan.

Tetramorium smithi MAYR

[Japanese name: Kadomune-shiwa-ari ONOYAMA, 1976]

Tetramorium Smithi MAYR, 1878: 673. Worker. Type locality: Calcutta (ROTHNEY leg., BMNH, NM-Vienna).

Tetramorium smithi, BOLTON, 1977: 90. Worker.

Xiphomyrmex sp., ONOYAMA, 1976: 125, 129.

I collected workers walking on relatively open grounds such as road sides at wood margins, and probably under stones. This species was collected only from Naha, and seems to be rare in Okinawa-Ken. I have never obtained it from the other localities.

Material examined: 13, 3, 3, and 6 workers at 4 sites respectively on the campus of University of the Ryukyus, Naha, 26-VI-1974, and 1 worker at another site of the University, 31-III-1975, K. ONOYAMA leg.; 1 dealate and 1 alate females, 6 workers, 3 worker pupae, 1 larva, University of the Ryukyus, 4-V-1975, T. ABE leg.

II. Check List of the Ants of Japan

Procedures. From more than 400 references on Japanese ants (excluding ants from the Chishima Islands), scientific names were picked up. These names were checked with reference to CHAPMAN & CAPCO (1951) and KUBOTA (1971) not to miss any names and synonymies. From CHAPMAN & CAPCO (1951), 105 forms (counting synonymous names), which are recorded as occurring in Japan, were extracted, 3 forms being excluded: *Aphaenogaster* (*Attomyrma*) *rothneyi tipuna* (from Taihoku), *Formica* (*Formica*) *pratensis* (from Sakhalin), and *Camponotus* (*Tanaemyrmex*) *irritans tincta* var. *volkensis* (misprint of Japen Is. ?).

WHEELER (1928 a) listed 86 available forms. KUBOTA (1971) gave 163 valid names and regarded 132 names as available. It is wrong that ETTERSHANK (1966: 123) wrote the locality of *Oligomyrmex aborensis* as Japan (correctly India). In the following list, I present 173 available names. An equality sign (=) means published synonymy. Every available name is given by its last status, but synonymous names are given by their original ones. References in brackets are those in which the names were first reported from Japan; the forms without references in brackets were originally described from Japan, or were first reported under synonymous names. References in which synonymy was established are also given in brackets with the abbreviated word "Syn.". The species with an asterisk (*, 67 species) are regarded to be identifiable.

Subfamilial arrangement is somewhat different from that of ONOYAMA (1976): the Myrmicinae is placed next to the Cerapachyinae, and the Leptanillinae next to the Myrmicinae. These changes have been made according to TAYLOR (1978, personal communication), who made important findings in construction of ant phylogeny. Generic and subgeneric arrangements follow ONOYAMA (1976); some

changes might perhaps be made according to KUGLER's (1978) study on the sting apparatus of myrmicine ants, but I have not done here because how to change is not very clear. Nomenclatural and taxonomic changes are made about the subgenera of *Leptothorax* (SMITH, 1950) and formerly the genus *Solenopsis* (BARONI URBANI, 1968). Specific names are arranged in alphabetical order within one genus or subgenus.

A Check List of the Ants of Japan (October 1979)

A. Living species (173 forms)

Subfamily **Ponerinae** (19 forms)

*1. *Amblyopone silvestrii* (WHEELER), 1928a: 97.

2. *Proceratium itoi* (FOREL), 1917: 717.

*3. *Proceratium japonicum* SANTSCHI, 1937: 362.

*4. *Proceratium watasei* (WHEELER), 1906: 303.

5. *Diacamma rugosum geometricum* var. *anceps* EMERY, 1897: 155. [MATSUMURA & UCHIDA, 1926: 51.]

*6. *Odontoponera transversa* (Fr. SMITH), 1857: 86. [TERANISHI, 1929c: 42.]

7. *Ectomomyrmex javanus* MAYR, 1867: 84.
=*Pachycondyla* (*Ectomomyrmex*) *japonica* EMERY, 1902: 31. [Syn. YASUMATSU, 1962: 94.]

8. *Ectomomyrmex sauteri* FOREL, 1912b: 49. [TERANISHI, 1933a: 78.]
=*Ectatomma horni*, SANTSCHI, 1937: 363. [Syn. ONOYAMA, 1976: 135.]

*9. *Brachyponera chinensis* (EMERY), 1894: 460.
=*Ponera solitaria* Fr. SMITH, 1874: 404. [Preoccupied, nec *solitaria* Fr. SMITH, 1860. Syn. BROWN, 1958b: 22.]
=*Brachyponera luteipes*, IMAI & YOSIDA, 1964: 64.
=*Brachyponera sinensis*, IMAI & KUBOTA, 1972: 194.

*10. *Trachymesopus pilosior* (WHEELER), 1928a: 98.
=*Euponera* (*Trachymesopus*) *chosonensis* TERANISHI, 1940: 8. [Syn. BROWN, 1963: 8.]

*11. *Cryptopone sauteri* (WHEELER), 1906: 304.

12. *Ponera excoecata* WHEELER, 1928b: 7. [WHEELER, 1928a: 99.]

13. *Ponera japonica* WHEELER, 1906: 306.
=*Ponera japonica* v. *crocea* SANTSCHI, 1941: 273. [Syn. TAYLOR, 1967: 76.]

14. *Ponera nippona* SANTSCHI, 1937: 364.

*15. *Ponera scabra* WHEELER, 1928a: 99.

*16. *Ponera yakushimensis* TANAKA, 1974: 32.

17. *Hypoponera zwalwenburgi* (WHEELER), 1933a: 14. [ABE & MAEDA, 1977: 78.]

18. *Leptogenys chinensis* (MAYR), 1870: 965. [DALLA TORRE, 1893: 44.]

*19. *Odontomachus monticola* EMERY, 1892: 560.
=*Myrtoteras kuroiwae* MATSUMURA, 1912: 191. [Syn. BROWN, 1976: 105.]
=*Odontomachus monticola* v. *Formosae* FOREL, 1912b: 46. [YANO, 1932: 340.] [Syn. YASUMATSU, 1962: 93.]

Subfamily **Cerapachyinae** (1 form)

*20. *Cerapachys biroi* FOREL, 1907a: 7.
=*Cerapachys* (*Syscia*) *silvestrii* WHEELER, 1909: 269. [WILSON & TAYLOR, 1967: 33.] [Syn. BROWN, 1975: 22.]

Subfamily **Myrmicinae** (78 forms)

21. *Myrmica kurokii* FOREL, 1907b: 18.

22. *Myrmica kurokii sontica* SANTSCHI, 1937: 367.
23. *Myrmica lobicornis jessensis* FOREL, 1901a: 371.
24. *Myrmica rubra* (LINNAEUS), 1758: 580.
    =*Myrmica laevinodis* NYLANDER, 1846a: 927. [FOREL, 1901a: 371.] [Syn. YARROW, 1955: 114.]
    =*Myrmica ruginodis* var. *ruginodo-laevinodis* FOREL, 1874: 78. [IMANISHI, 1930: 185.] [Syn. BRIAN & BRIAN, 1949: 393.]
25. *Myrmica rubra* var. *silvestrii* WHEELER, 1928a: 100.
26. *Myrmica rubra yoshiokai* WEBER, 1947: 451.
27. *Myrmica ruginodis* var. *kotokui* FOREL, 1911: 267.
*28. *Manica yessensis* AZUMA, 1955: 79.
*29. *Stenamma nipponense* YASUMATSU & MURAKAMI, 1960: 28.
*30. *Stenamma owstoni* WHEELER, 1906: 314.
31. *Aphaenogaster* (*Attomyrma*) *famelica* (Fr. SMITH), 1874: 405.
32. *Aphaenogaster* (*Attomyrma*) *famelica frontosa* WHEELER, 1928a: 104.
33. ***Aphaenogaster* (*Attomyrma*) *famelica* var. *osimensis* TERANISHI, 1940: 78.**
34. *Aphaenogaster* (*Attomyrma*) *famelica ruida* WHEELER, 1928a: 104.
35. *Aphaenogaster* (*Attomyrma*) *smythiesi japonica* FOREL, 1911: 267.
36. *Aphaenogaster* (*Attomyrma*) *vapida* WHEELER, 1928a: 105.
37. *Aphaenogaster* (*Attomyrma*) *verecunda* WHEELER, 1928a: 105.
*38. *Messor aciculatus* (Fr. SMITH), 1874: 405.
    =*Stenamma* (*Messor*) *aciculatum* v. *brunneicorne* FOREL, 1901b: 60. [Syn. YANO, 1910: 420.]
39. *Pheiodle fervida* Fr. SMITH, 1874: 406.
40. *Pheiodle indica* MAYR, 1878: 679. [OKAMOTO, 1957: 39.]
*41. *Pheidole megacephala* (FABRICIUS), 1793: 361. [SONOBE, 1973: 15.]
42. *Pheidole nodus* Fr. SMITH, 1874: 407.
    =*Pheidole nodus* var. *praevexata* WHEELER, 1929: 3. [Syn. YASUMATSU, 1962: 96.]
43. *Pheidole pieli* SANTSCHI, 1925: 83. [WHEELER, 1928a: 108.]
44. *Leptothorax* (*Leptothorax*) *acervorum* (FABRICIUS), 1793: 358. [MORISITA, 1940: 54.]
45. *Leptothorax* (*Myrafant*) *congruus* Fr. SMITH, 1874: 406.
46. *Leptothorax* (*Myrafant*) *congruus* var. *spinosior* FOREL, 1901a: 371.
47. *Leptothorax* (*Nesomyrmex*) *koreanus* TERANISHI, 1940: 16. [MORISITA, 1945: 25.]
*48. *Triglyphothrix lanuginosa* (MAYR), 1870: 972.
    =*Tetramorium obecum* race *striatidens* EMERY, 1889b: 501. [OKAMOTO, 1972: 14.] [Syn. BOLTON, 1976: 350.]
*49. *Tetramorium amium* FOREL, 1912b: 53. [YASUMATSU, 1940: 68.]
*50. *Tetramorium bicarinatum* (N[illegible]NDER), 1846b: 1061.
    =*Tetramorium guineense*, MAYR, 1862, etc. [Misidentification. Syn. BOLTON, 1977: 94.] [TERANISHI, 1927b: 123.]
51. *Tetramorium caespitum* (LINNAEUS), 1758: 581. [FOREL, 1900: 268.]
    =*Tetramorium caespitum simileve*[!] variety *jacoti* WHEELER, 1923: 3. [WHEELER, 1928a: 115.] [Syn. YASUMATSU, 1962: 96.]
52. *Tetramorium caespitum* var. *japonica* RÖSZLER, 1936: 3.
53. *Tetramorium caespitum tsushimae* EMERY, 1925: 187.
54. *Tetramorium caespitum tsushimaeum* var. *pullum* SANTSCHI, 1941: 277.
*55. *Tetramorium kraepelini* FOREL, 1905: 15.
    Tetramorium yanoi SANTSCHI, 1937: 376. [Syn. BOLTON, 1977: 117.]
*56. *Tetramorium nipponense* WHEELER, 1928a: 115.
*57. *Tetramorium simillimum* Fr. SMITH, 1851: 118. [SONOBE, 1973: 15.]
*58. *Tetramorium smithi* MAYR, 1878: 673. [This report.]

*59. *Tetramorium tanakai* BOLTON, 1977: 119.
*60. *Tetramorium tonganum* MAYR, 1870: 972. [BOLTON, 1977: 130.]
61. *Monomorium floricola* (JERDON), 1851: 107. [WHEELER, 1906: 310.]
=*Monomorium intrudens* Fr. SMITH, 1874: 406. [Syn. EMERY in WHEELER, 1906: 310, and EMERY, 1908: 682. See TERANISHI, 1929c: 41.]
62. *Monomorium fossulatum* EMERY, 1894: 465. [SHINDO, 1979: 27.]
63. *Monomorium latinode* MAYR, 1872: 152. [TERANISHI, 1929c: 42.]
64. *Monomorium minutum* MAYR, 1855: 453. [TERANISHI, 1929b: 323.]
65. *Monomorium minutum chinensis* SANTSCHI, 1925: 86. [WHEELER, 1928a: 113.]
66. *Monomorium nipponense* WHEELER, 1906:310.
67. *Monomorium nipponense* var. *gracilum* TERANISHI, 1940: 29.
68. *Monomorium nipponense* var. *robustum* TERANISHI, 1940: 29.
69. *Monomorium nipponense* var. *satoi* TERANISHI, 1940: 30.
*70. *Monomorium pharaonis* (LINNAEUS), 1758: 580. [TERANISHI, 1928: 241.]
71. *Monomorium triviale* WHEELER, 1906:311.
72. *Diplorhoptrum fugax* (LATREILLE), 1798: 46. [ANDRÉ, 1903: 128.]
73. *Diplorhoptrum fugax* var. *japonica* (WHEELER), 1928a: 113.
74. *Oligomyrmex sauteri* FOREL, 1912b: 56. [AZUMA, 1951: 87.]
*75. *Vollenhovia emeryi* WHEELER, 1906: 312.
76. *Vollenhovia emeryi chosenica* WHEELER, 1928a: 113. [TERANISHI, 1933a: 79.]
*77. *Lordomyrma azumai* (SANTSCHI), 1941: 275.
=*Lordomyrma nobilis* YASUMATSU, 1950: 75. [Syn. BROWN, 1952: 124.]
*78. *Myrmecina graminicola nipponica* WHEELER, 1906: 307.
*79. *Pristomyrmex pungens* MAYR, 1866b: 904.
=*Pristomyrmex japonicus* FOREL, 1900: 268. [Syn. VIEHMEYER, 1922: 207.]
80. *Cardiocondyla emeryi* FOREL, 1881: 5. [SONOBE, 1972: 179.]
81. *Cardiocondyla nuda* MAYR, 1866a: 508. [SANTSCHI, 1937: 371.]
82. *Cardiocondyla wroughtoni* (FOREL), 1890b: 111. [SHINDO, 1979: 25.]
83. *Crematogaster* (*Crematogaster*) *brunnea ruginota* var. *azumai* SANTSCHI, 1941: 275.
84. *Crematogaster* (*Crematogaster*) *brunnea teranishii* SANTSCHI, 1930: 265.
85. *Crematogaster* (*Crematogaster*) *laboriosa* Fr. SMITH, 1874: 407.
86. *Crematogaster* (*Crematogaster*) *laboriosa* var. *nawai* ITO, 1914: 41.
87. *Crematogaster* (*Crematogaster*) *matsumurai* FOREL, 1901a: 372.
88. *Crematogaster* (*Crematogaster*) *matsumurai* var. *iwatensis* SANTSCHI, 1930: 264.
89. *Crematogaster* (*Crematogaster*) *matsumurai vagula* WHEELER, 1928a: 110.
*90. *Crematogaster* (*Orthocrema*) *sordidula osakensis* FOREL, 1900: 269.
=*Crematograster sordidula* var. *japonica* FOREL, 1912a: 339. [Syn. BROWN, 1949b: 37.]
91. *Strumigenys lewisi* CAMERON, 1887: 229.
*92 *Strumigenys solifontis* BROWN, 1949a: 18
*93. *Quadristruma emmae* (EMERY), 1890: 70. [KUBOTA, 1976: 4.]
*94. *Smithistruma incerta* BROWN, 1949a: 10.
=*Smithistruma* (*Smithistruma*) *habei* AZUMA, 1951: 89. [Syn. This report.]
*95. *Smithistruma rostrataeformis* BROWN, 1949a: 12.
*96. *Pentastruma carina* BROWN & BOISVERT, 1979: 203.
*97. *Weberistruma japonica* (ITO), 1914: 40.
*98. *Trichoscapa membranifera* EMERY, 1869: 24. [MIYAMOTO *et al.*, 1954: 28.]
*99. *Kyidris mutica* BROWN, 1949a: 3.
=*Polyhomoa itoi* AZUMA, 1950: 36. [Syn. BROWN & YASUMATSU, 1951: 94.]
*100. *Epitritus hexamerus* BROWN, 1958a: 70.

Subfamily **Leptanillinae** (5 forms)

*101. *Leptanilla japonica* BARONI URBANI, 1977: 460.
*102. *Leptanilla kubotai* BARONI URBANI, 1977: 444.
103. *Leptanilla morimotoi* YASUMATSU, 1960: 17.
*104. *Leptanilla oceanica* BARONI URBANI, 1977: 450.
*105. *Leptanilla tanakai* BARONI URBANI, 1977: 458.

Subfamily **Dolichoderinae** (7 forms)

106. *Dolichoderus sibiricus* EMERY, 1889a: 442. [WHEELER, 1933b: 67.]
=*Dolichoderus* (*Hypoclinea*) *quadripunctatus* subsp. *yoshiokae* WHEELER, 1933b: 67. [Syn. YASUMATSU, 1941: 182.]
=*Dolichoderus* (*Hypoclinea*) *abietis* KÔNO & SUGIHARA, 1939: 12. [Syn. YASUMATSU, 1941: 182.]
=*Dolichoderus quadripunctatus* subsp. *japonicus* YOSHIOKA, 1939: 70. [Syn. YASUMATSU, 1941: 182.]
107. *Iridomyrmex glaber* (MAYR), 1862: 705. [TERANISHI, 1929c: 42.]
108. *Iridomyrmex itoi* FOREL, 1900: 269.
=*Iridomyrmex itoi* var. *abbotti* WHEELER, 1906: 318. [Syn. YANO, 1910: 420.]
109. *Tapinoma indicum* FOREL, 1895a: 472. [TERANISHI, 1929b: 313.]
110. *Tapinoma melanocephalum* (FABRICIUS), 1793: 353. [TERANISHI, 1927a: 51.]
111. *Technomyrmex albipes* (Fr. SMITH), 1861: 38. [TERANISHI, 1929b: 313.]
=*Technomyrmex detorquens*, OKAMOTO, 1966: 7. [See BROWN, 1958b: 41.]
112. *Technomyrmex gibbosus* WHEELER, 1906: 319.

Subfamily **Formicinae** (58 forms)

113. *Acropyga* (*Rhizomyrma*) *sauteri* FOREL, 1912b: 72. [TERANISHI, 1929a: 250.]
*114. *Anoplolepis longipes* (JERDON), 1851: 122. [TERANISHI, 1929c: 42.]
*115. *Paratrechina* (*Paratrechina*) *longicornis* (LATREILLE), 1802b: 113. [TERANISHI, 1924: 53.]
116. *Paratrechina* (*Nylanderia*) *bourbonica* (FOREL), 1886: 210.
=*Paratrechina bourbonica* race *bengalensis* FOREL, 1894b: 406. [TERANISHI, 1929c: 42] [Syn. WILSON & TAYLOR, 1967: 88.]
117. *Paratrechina* (*Nylanderia*) *flavipes* (Fr. SMITH), 1874: 404.
118. *Paratrechina* (*Nylanderia*) *minutula sauteri* (FOREL), 1913b: 198. [WHEELER, 1928a: 120.]
119. *Paratrechina* (*Nylanderia*) *sakurae* (ITO), 1914: 43.
120. *Paratrechina* (*Nylanderia*) *teranishii* SANTSCHI, 1937: 386.
121. *Lasius* (*Lasius*) *alienus* FOERSTER, 1850: 36. [ANDRÉ, 1903: 128.]
122. *Lasius* (*Lasius*) *hayashi* YAMAUCHI & HAYASHIDA, 1970: 510.
123. *Lasius* (*Lasius*) *niger* (LINNAEUS), 1758: 580. [Fr. SMITH, 1874: 403.]
=*Lasius niger* var. *alieno-niger* FOREL, 1874: 47. [ITO, 1914:44.] [Syn. WILSON, 1955: 59.]
=*Lasius niger* st. *coloratus* SANTSCHI, 1937: 387. [Syn. WILSON, 1955: 60.]
=*Lasuis emarginatus* v. *japonicus* SANTSCHI, 1941: 277. [Syn. WILSON, 1955: 60.]
*124. *Lasius* (*Lasius*) *productus* WILSON, 1955: 95.
*125. *Lasius* (*Lasius*) *sakagamii* YAMAUCHI & HAYASHIDA, 1970: 504.
126. *Lasius* (*Cautolasius*) *flavus* (FABRICIUS), 1781: 491. [TERANISHI, 1917: 9.]
=*Lasius flavus* r. *myops* FOREL, 1894a: 12. [MORISITA, 1945: 26.] [Syn. WILSON, 1955: 112.]
127. *Lasius* (*Cautolasius*) *sonobei* YAMAUCHI, 1979: 163.
*128. *Lasius* (*Cautolasius*) *talpa* WILSON, 1955: 136.
=*Lasius flavus myops*, WHEELER, 1906: 322. [Syn. WILSON, 1955: 138.]
129. *Lasius* (*Chthonolasius*) *hikosanus* YAMAUCHI, 1979: 169.
130. *Lasius* (*Chthonolasius*) *umbratus* (NYLANDER), 1846b: 1048. [FOREL, 1900: 269.]
=*Lasius umbratus* var. *mixto-umbratus* FOREL, 1874: 48. [ITO, 1914: 44.] [Syn. WILSON, 1955: 151.]

=*Lasius silvestrii* WHEELER, 1928a: 120. [Syn. WILSON, 1955: 152. This synonymy might be erroneous. Also see TERANISHI, 1933b: 85.]
=*Lasius silvestri*[!] var. *osakana* SANTSCHI, 1941: 278. [Syn. WILSON, 1955: 152.]
=*Formicina rabaudi* BONDROIT, 1917a: 177. [WILSON, 1955: 170.] [Syn. BOURNE, 1973: 25.] [*Rabaudi*≒*umbratus*, YAMAUCHI, 1979: 166. I do not agree to this treatment. The Japanese species referable to YAMAUCHI's *rabaudi* might be *silvestrii* WHEELER.]

*131. *Lasius* (*Dendrolasius*) *crispus* WILSON, 1955: 144.

132. *Lasius* (*Dendrolasius*) *fuliginosus* (LATREILLE), 1798: 36. [Fr. SMITH, 1874: 403.]
=*Lasius fuliginosus* var. *nipponensis* FOREL, 1912a: 339. [Syn. WILSON, 1955: 138. This synonymy might be erroneous.]

*133. *Lasius* (*Dendrolasius*) *morisitai* YAMAUCHI, 1979: 176.

*134. *Lasius* (*Dendrolasius*) *spathepus* WHEELER, 1910: 130.

*135. *Lasius* (*Dendrolasius*) *teranishii* WHEELER, 1928a: 120.
=*Lasius umbratus* ?, TERANISHI, 1927c: 90. [Syn. WHEELER, 1928a: 120.]
=*Lasius* (*Chthonolasius*) *Ouchii* TERANISHI, 1940:76. [Syn. MORISITA, 1945: 23.]

*136. *Formica* (*Raptiformica*) *sanguinea* LATREILLE, 1798: 37. [ANDRÉ, 1903: 128.]
=*Formica sanguinea* var. *fusciceps* EMERY, 1895: 335. [Syn. DLUSSKY, 1965: 16.]

*137. *Formica* (*Coptoformica*) *fukaii* WHEELER, 1914: 26.
=*Formica exsecta*, YANO, 1912: 128. [Syn. SONOBE & DLUSSKY, 1977: 23.]

138. *Formica* (*Formica*) *truncorum* FABRICIUS, 1804: 403. [TERANISHI, 1929a: 243.]
=*Formica truncicola* NYLANDER, 1846a: 907. [ANDRÉ, 1903: 128.] [Syn. BONDROIT, 1918: 60.]

139. *Formica* (*Formica*) *truncorum* var. *yessensis* FOREL, 1901b: 66. [*Yessensis*=*lugubris*, DLUSSKY, 1967: 91.] [*Yessensis*≒*lugubris*, SONOBE, 1977b: 2.]

*140. *Formica* (*Serviformica*) *gagatoides* RUZSKY, 1904: 289. [SONOBE & DLUSSKY, 1977: 23.]

*141. *Formica* (*Serviformica*) *japonica* MOTSCHULSKY, 1866: 183.
=*Forica fusca* v. *nipponensis* FOREL, 1900: 270. [Syn. EMERY, 1909: 197.]

142. *Formica* (*Serviformica*) *lemani* BONDROIT, 1917b: 186. [KONDOH, 1968: 126.]

143. *Formica* (*Serviformica*) *transkaucasica* NASONOV, 1889: 21. [KONDOH, 1968: 132.]
=*Formica picea* NYLANDER, 1846a: 917. [TERANISHI, 1929a: 244.] [Preoccupied, nec *picea* LEACH, 1825, see YARROW, 1954: 232.]

144. *Formica* (*Serviformica*) *transkaucasica* var. *yatsuensis* TERANISHI, 1940: 80.

145. *Formica* (*Serviformica*) *yoshiokae* WHEELER, 1933b: 66.

*146. *Polyergus samurai* YANO, 1911: 110.

147. *Camponotus* (*Camponotus*) *hemichlaena* YASUMATSU & BROWN, 1951: 40.

148. *Camponotus* (*Camponotus*) *herculeanus* var. *sachalinensis* FOREL, 1904: 381. [TERANISHI, 1932: 50.]

149. *Camponotus* (*Camponotus*) *japonicus* MAYR, 1866b: 885.
=*Camponotus pennsylvanicus* var. *atterima* EMERY, 1894: 478. [TERANISHI, 1929a: 240.] [Syn. YASUMATSU & BROWN, 1951: 36.]
=*Camponotus herculeanus saxatilis* RUZSKY, 1895: 7. [TERANISHI, 1932: 51.] [Syn. YASUMATSU & BROWN, 1951: 37.]

150. *Camponotus* (*Camponotus*) *obscuripes* MA[illegible] 1878: 645.
=*Camponotus ligniperdus*, Fr. SMITH, 1874: 402. [Syn. YASUMATSU & BROWN, 1951: 38.]

*151. *Camponotus* (*Camponotus*) *yessensis* TERANISHI, 1940: 72.

152. *Camponotus* (*Tanaemyrmex*) *devestivus* WHEELER, 1928a: 117.

153. *Camponotus* (*Tanaemyrmex*) *habereri* FOREL, 1911: 293.

154. *Camponotus* (*Tanaemyrmex*) *siemsseni* FOREL, 1901b: 70. [YASUMATSU, 1940: 69.]

155. *Camponotus* (*Tanaemyrmex*) *variegatus* var. *dulcis* EMERY, 1889b: 511. [YASUMATSU, 1940: 69.]

*156. ***Camponotus (Paramyrmamblys) kiusiuensis*** SANTSCHI, 1937: 379.
157. *Camponotus* (*Myrmentoma*) *caryae brunni* FOREL, 1901b: 70.
158. *Camponotus* (*Myrmentoma*) *caryae* var. *keihitoi* FOREL, 1913a: 663.
159. *Camponotus* (*Myrmentoma*) *caryae* var. *nawai* ITO, 1914: 44.
*160. *Camponotus* (*Myrmentoma*) *caryae* var. *quadrinotatus* FOREL, 1886: 142.
161. *Camponotus* (*Myrmentoma*) *caryae* var. *teranishii* WHEELER, 1928a: 118.
Camponotus tokyoensis TERANISHI, 1915: 137. [Preoccupied, nec *tokioensis* ITO, 1912.]
162. *Camponotus* (*Myrmentoma*) *marginatus vitiosus* Fr. SMITH, 1874: 403.
163. *Camponotus* (*Myrmamblys*) *itoi* FOREL, 1912a: 340.
164. *Camponotus* (*Myrmamblys*) *nigronitidus* AZUMA, 1951: 89.
*165. *Camponotus* (*Myrmamblys*) *nipponensis* SANTSCHI, 1937: 381.
166. *Camponotus* (*Myrmamblys*) *tokioensis* ITO, 1912:341.
167. *Camponotus* (*Myrmamblys*) *tokioensis* var. *atrigenatus* SANTSCHI, 1937: 384.
168. *Camponotus* (*Myrmamblys*) *tokioensis* var. *inconstans* SANTSCHI, 1937: 385.
*169. *Camponotus* (*Colobopsis*) *nipponicus* WHEELER, 1928a: 118.
Camponotus (*Colobopsis*) *rothneyi*, WHEELER, 1906: 327. [Syn. WHEELER, 1928a: 119.]
Camponotus (*Colobopsis*) *truncatus*, ITO, 1914: 45. [Syn. WHEELER, 1928a: 119.]
*170. *Polyrhachis* (*Myrma*) *latona* WHEELER, 1909b: 337. [ONOYAMA, 1976: 126.]
*171. *Polyrhachis* (*Myrmhopla*) *dives* Fr. SMITH, 1857: 64. [SONAN, 1912: 438.]
*172. *Polyrhachis* (*Myrmhopla*) *hippomanes* var. *moesta* EMERY, 1887: 237. [TERANISHI, 1933a: 80.]
*173. *Polyrhachis* (*Polyrhachis*) *lamellidens* Fr. SMITH, 1874: 403.

The following 11 forms are excluded from the above list because of doubtful identifications.

A2. Doubtful identifications (11 forms)
1. *Ponera coarctata* (LATREILLE), 1802a: 65. [YANO, 1910: 419.] [About distribution, see TAYLOR, 1967: 26.]
2. *Hypoponera gleadowii* (FOREL), 1895b: 292. [AZUMA, 1952: 2.]
3. *Cerapachys typhlus* (ROGER), 1861: 20. [SONOBE, 1973: 15.] [See ONOYAMA, 1976: 128.]
4. *Myrmica lobicornis* NYLANDER, 1846a: 933. [SONOBE, 1971: 202.] [By my recent unpublished study.]
5. *Myrmica ruginodis* NYLANDER, 1846a: 929. [HAYASHIDA, 1957: 173.] [By my recent unpublished study.]
6. *Myrmica scabrinodis* NYLANDER, 1846a: 931. [MORISITA, 1940: 54.] [By my recent unpublished study.]
7. *Aphaenogaster smythiesi* FOREL, 1902: 222. [KOGURE, 1959: 34.]
8. *Crematogaster* (*Crematogaster*) *brunnea ruginota* FOREL, 1902: 207. [AZUMA, 1938: 240.]
9. *Formica* (*Formica*) *rufa* LINNAEUS, 1758: 580. [OHTA, 1936: 167.]
10. *Formica* (*Serviformica*) *fusca* LINNAEUS, 1758: 580. [KONDOH, 1968: 126.]
=*Formica glebaria* NYLANDER, 1846a: 917. [TERANISHI, 1929a: 244.] [Syn. YARROW, 1954: 230.]
11. *Camponotus* (*Myrmentoma*) *marginatus* LATREILLE, 1798: 35. [ANDRÉ, 1903: 128.] [Based on the male only.]

A3. Identifications originally with question marks (4 forms)
1. *Pheidole fervens* (?) Fr. SMITH, 1858: 176. [ABE *et al.*, 1976: 115.]
2. *Pheidole oceanica* (?) MAYR, 1866a: 510. [ABE *et al.*, 1976: 115.]
3. *Monomorium destructor* (?) (JERDON), 1851: 105. [ONOYAMA, 1976: 125.]
4. *Cardiocondyla nuda mauritanica* ? FOREL, 1890a: 75. [TERANISHI, 1929b: 316.]
=*Cardiocondyla wroughtoni*, TERANISHI, 1940: 46. [See TERANISHI, 1940: 48.]

Table 1. Number of living species recorded or here recognized in each genus of ants of Japan.

Generic name	No. of forms recorded	No. of species recognized
Subfam. **Ponerinae**	[19]	[31]
1. *Amblyopone*	1	5
2. *Probolomyrmex*	0	1
3. *Proceratium*	3	4
4. *Discothyrea*	0	1
5. *Diacamma*	1	1
6. *Odontoponera*	1*	0*
7. *Ectomomyrmex*	2	1
8. *Brachyponera*	1	1
9. *Trachymesopus*	1	2
10. *Cryptopone*	1	2
11. *Ponera*	5	6
12. *Hypoponera*	1	5
13. *Leptogenys*	1	1
14. *Odontomachus*	1	1
Subfam. **Cerapachyinae**	[1]	[2]
15. *Cerapachys*	1	2
Subfam. **Myrmicinae**	[78]	[106]
16. *Myrmica*	7	6
17. *Manica*	1	1
18. *Stenamma*	2	2
19. *Aphaenogaster*	7	7
20. *Messor*	1	1
21. *Pheidole*	5	9
22. *Leptothorax*	4	12
Leptothorax s. str.	(1)	(1)
Myrafant	(2)	(10)
Nesomyrmex	(1)	(1)
23. *Triglyphothrix*	1	1
24. *Tetramorium*	12	10
25. *Strongylognathus*	0	1
26. *Monomorium*	11	9
27. *Diplorhoptrum*	2	2
28. *Oligomyrmex*	1	3
29. *Trigonogaster*	0	1
30. *Vollenhovia*	2	3
31. *Lordomyrma*	1	1
32. *Myrmecina*	1	5
33. *Pristomyrmex*	1	2
34. *Cardiocondyla*	3	3
35. *Crematogaster*	8	5
Crematogaster s. str.	(7)	(4)
Orthocrema	(1)	(1)
36. *Strumigenys*	2	7
37. *Quadristruma*	1	1
38. *Smithistruma*	2	3
39. *Pentastruma*	1	1
40. *Weberistruma*	1	4
41. *Trichoscapa*	1	1
42. *Codiomyrmex*	0	1

(Table 1. Continued)

Generic name	No. of forms recorded	No. of species recognized
43. Un-named new genus A	0	1
44. *Kyidris*	1	1
45. *Epitritus*	1	2
Subfam. **Dorylinae**	[0]	[1]
46. *Aenictus*	0	1
Un-named new subfamily	[0]	[3]
47. Un-named new genus B	0	2
48. Un-named new genus C	0	1
Subfam. **Leptanillinae**	[5]	[6]
49. *Leptanilla*	5	6
Subfam. **Dolichoderinae**	[7]	[6]
50. *Dolichoderus*	1	1
51. *Iridomyrmex*	2	1
52. *Tapinoma*	2	2
53. *Technomyrmex*	2	2
Subfam. **Formicinae**	[61]	[64]
54. *Acropyga*	1	3
Rhizomyrma	(1)	(2)
Atopodon	(0)	(1)
55. *Plagiolepis*	0	1
56. *Anoplolepis*	1	1
57. *Prenolepis*	0	1
58. *Paratrechina*	6	9
Paratrechina s. str.	(1)	(2)
Nylanderia	(5)	(7)
59. *Lasius*	15	15
Lasius s. str.	(5)	(4)
Cautolasius	(3)	(3)
Chthonolasius	(2)	(3)
Dendrolasius	(5)	(5)
60. *Formica*	10	9
Raptiformica	(1)	(1)
Coptoformica	(1)	(1)
Formica s. str.	(2)	(2)
Serviformica	(6)	(5)
61. *Polyergus*	1	1
62. *Camponotus*	23	20
Camponotus s. str.	(5)	(5)
Tanaemyrmex	(4)	(6)
Paramyrmamblys	(1)	(1)
Myrmentoma	(6)	(2)
Myrmamblys	(6)	(4)
Colobopsis	(1)	(2)
63. *Polyrhachis*	4	4
Myrma	(1)	(1)
Myrmhopla	(2)	(2)
Polyrhachis s. str.	(1)	(1)
Total (**Formicidae**)	173	219

* Introduced?: exact locality is unknown.

B. Living species recorded only at botanical gardens (BG) or quarantine stations (QS) (5 forms)
1. *Leptogenys punctiventris* (MAYR), 1878: 666. [BG; AZUMA, 1951: 86.]
2. *Aphaenogaster* (*Attomyrma*) *fulva* ROGER, 1863: 190. [QS; OHTA, 1938: 312.]
3. *Pheidole nodus azumai* SANTSCHI, 1941: 274. [BG.]
4. *Tetramorium indicum* FOREL, 1913c: 81. [BG; SANTSCHI, 1941: 276.]
5. *Crematogaster* (*Orthocrema*) *quadriformis* ROGER, 1863: 207. [QS; OHTA, 1938: 343.]

C. Fossil species (1 form)
1. *Aphaenogaster* (*Deromyrma*) *avita* FUJIYAMA, 1970: 67. [Middle Miocene.]

III. Number of Living Species in Each Genus

ONOYAMA (1976) gave a list of ant genera of Japan and recognized about 200 species as occurring in Japan. Here I consider that at least 219 species are living in Japan. The number of species I have recognized in each genus is shown in Table 1 together with the number of forms listed above (list A). The difference between the two totals is 46. I think that about 10 forms in the check list are synonymous to other forms, and that a few forms may be excluded from the Japanese fauna. Thus, about 60 species remain unidentified.

With the development of our knowledge about the classification of Japanese ants especially of the genera *Aphaenogaster*, *Pheidole*, *Leptothorax*, *Crematogaster*, *Paratrechina*, *Lasius*, and *Camponotus*, we must recognize more species than here counted. Also, if we collect more ants from various localities, we must discover more species even from genera nc Japan especially in ponerine and myrmicine ants. I will try to estimate elsewhere the final number of ant species living in Japan on the basis of several theoretical considerations.

Lists of ant species found in some areas such as within a prefecture or an island will be published. In this case, for example, a statement of *Leptothorax* sp. without morphological description does scarcely mean anything because the subgenus *Myrafant* of *Leptothorax* has at least 10 species in Japan as is shown in Table 1. Also listing the name of *Leptothorax congruus* or *L. spinosior* has little information at least to me until revisionary works are published. Determination only on the basis of old literature is dangerous. For example, what AZUMA (1977: 321) called *Crematogaster laboriosa* is certainly not *laboriosa* Fr. SMITH judging from its distribution (see ONOYAMA, 1976: 131).

We do not know identities of a number of species. Needless to say, this is an unfortunate matter. The number of species in each genus shown in Table 1 might offer some information for future revisers of ants of Japan.

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* I was unable to see these literature, which have been cited from CHAPMAN & CAPCO (1951), BARONI URBANI (1971) [Catalogo delle specie di Formicidae d'Italia. *Mem. Soc. Ent. Ital.*, **50**: 5–287.], BROWN (1975), KEMPF (1972) [Catálogo abreviado das formigas da Região Neotropical (Hymenoptera: Formicidae). *Studia Ent.*, **15**: 3–344.], and Zoological Record, etc.

Postscript

1) Recently I have been informed the presence of AZUMA's publication by Mr. M. KUBOTA to whom I am very grateful. AZUMA in 1977 described *Leptothorax* (*Leptothorax* [!]) *arimensis* as a new species. I do not know whether that name is valid. However, at least, the availability of that name may be doubtful. The distinction of *L. arimensis* from *spinosior* and *congruus* (that AZUMA made) does not make believe *arimensis* as new to science, because *arimensis* seems to more closely resemble *eburneipes*, *galeatus*, or *argentipes* described from China by WHEELER in 1927 or 1928 than *spinosior* or *congruus*.

2) I have missed one form recorded from Japan. Insert the following statement immediately before No. 21 under the subfamily Myrmicinae in the list A: "*Myrmica kasczenkoi* RUZSKY, 1905: 702. [COLLINGWOOD, 1976: 302.]".

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Errata

page	line	Reads:	Change to:	ponsibility
197	23	39. *Pheiodle fervida*	39. *Pheidole fervida*	P
197	24	40. *Pheiodle indica*	40. *Pheidole indica*	P
199	23	113. *Acropyga* (*Rhizomyryma*	113. *Acropyga* (*Rhizomyrma*	A(half)
200	27	=*Forica fusca*	=*Formica fusca*	A
207	11	——1886. È̀tudes	——1886. É́tudes	P
208	43	*——1866b. Diganosen	*——1866b. Diagnosen	P
209	1	..... Shinkonthu,	..... Shinkontyu,	A
209	12	..... (In Russian)	..... (In Russian.)	P
209	18	..... 284-286.	 284-286,	P
210	2	..... of nes species...	..... of new species...	P
212	1	...see these literature,	...see these references,	E
212	19	..... 7:114-116.	..... 7:112-118.	A(half)

(When correction was not made in spite of the author's indication in the galley proof, I regarded that the printer is responsible for the misprint.)

K. Onoyama. 1980.08.19.